AN 92-000492 [01] WPIDS
DNC C92-000219
TI Conversion of higher di alkyl ether into di carboxylic acid - in presence of yeast mutant with interrupted beta-oxidn. path.
DC A41 D16 E17 H07
IN EIERDANZ, H; MEUSSDORFF, F; SCHINDLER, J; STOLL, G; WALDHOFF, H
PA (HENK) HENKEL KGAA
CYC 1
PI DE 4019166 A 911219 (9201)* <--
ADT DE 4019166 A DE 90-4019166 900615
PRAI DE 90-4019166 900615
AN 92-000492 [01] WPIDS
AB DE 4019166 A UPAB: 931006
Process is in presence of yeast mutants, with beta-oxidn. path of which has been interrupted. At least 10C dialkyl ethers of more than 1C in each alkyl are converted to ether dicarboxylic acids.

Symmetrical dialkyl ethers with 5-22C in each alkyl are pref. used. Pref. a mutant is of Candida pichia or Saccharomyces in which the beta-oxidn. path has been interrupted by classic mutangenesis or by genetic manipulation, or of C. lipolytica or C. tropicalis.

USE/ADVANTAGE - Long-chain (I) which are difficult to obtain by classic synthesis can be obtd. (I) are used in prodn. of polyesters and polyamides, and in the field of lubricants.

In an example, pre-culture of C. tropicalis was grown in a supplemented "Yeast-Nitrogen-Base" (RTM) medium for 48 hrs. at 30 deg. C Cells were transferred to a 0.2M phosphate buffer pH 7.8, with "Yeast-Nitrogen-Base w/o aminoacids" (RTM) contg. 0.3% of "Myrj52" (RTM:ethoxylated sorbitan ester) and 3% of di-n-octyl ether. After 168 hrs., 1g/l of ether dicarboxylic acid had been formed.

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TRANSLATION

West German Preliminary Published Application **DE 40 19 166 A1**

Example

Medium A: "Yeast-nitrogen base" medium (Difco Co.) pH 6.8, supplemented with 1.3% glucose, 0.5% glycerine, 0.3% Na acetate, 0.3% peptone and 0.6% yeast extract plus 0.5% transformation educt.

Medium B: 0.2 M phosphate buffer, pH 7.8 with "yeast nitrogen base w/o amino acids" (Difco), 0.3% ethoxylated sorbitan ester MYRJ52® and 3% substrate.

Candida tropicalis: DSM 4131 was inoculated in 100 ml YM nutrient bouillon (Difco., 500 ml Erlenmeyer flasks with baffles) and shaken for 36 h at 140 rpm. From this preliminary culture an aliquot (10 ml) was used to inoculate 500 ml of medium A in the 2 liter Erlenmeyer flask. This culture was shaken for 48 h at 30°C (140 rpm) and then centrifuged off under sterile conditions in 100 ml aliquots. The cells were resuspended in 100 ml of medium B (500 ml Erlenmeyer flask) at which time di-n-octyl ether served as the substrate. After 24 hours in each case the pH of the batch was checked, adjusted if necessary and the progress of the transformation checked by TLC with subsequent staining for carboxyl groups. The appearance of positive bands after staining with iron chloride indicated the formation of carboxylic acids. After 60, 80 and 168 h acetic ester extracts of aliquots of the batch were studied for their composition by

HPLC. Newly formed compounds were characterized after separation and derivatization by GCMS. In this way it could be shown that 1.0 g/l of ether dicarboxylic acid had formed after 168 h.

Claims

1. Process for transforming substituted alkanes into dicarboxylic acids with at least a predominantly equal number of C atoms in the presence of yeast mutants whose β oxidation path is interrupted, characterized by the fact that dialkyl ether with more than 1 C atom in each alkyl radical and a total of at least 10 C atoms is transformed into ether dicarboxylic acids.

2. Process as in claim 1 characterized by the fact that symmetrical dialkyl ethers with 5 to 22 C atoms are used in each alkyl radical.

3. Process as in one of claims 1 and 2 characterized by the fact that one works in the presence of a mutant of a strain of the family Candida pichia or Saccharomyces in which the β oxidation pathway has been interrupted by classical mutagenesis or by genetic engineering manipulation.

4. Process as in one of claims 1 through 3 characterized by the fact that one works in the presence of a mutant of Candida lipolytica or Candida tropicalis.

Translation:
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